

1     What is claimed is:

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3     1.     A method of operating a plurality of virus checkers for on-demand anti-virus  
4     scanning concurrent with on-access anti-virus scanning, the method comprising:

5                 combining on-demand anti-virus scan requests and on-access anti-virus scan  
6     requests in a virus scan request queue; and

7                 distributing the on-demand anti-virus scan requests and the on-access anti-virus  
8     scan requests from the virus scan request queue to the virus checkers.

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10    2.     The method as claimed in claim 1, wherein the on-access anti-virus scan requests  
11    are produced in response to user access to files.

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13    3.     The method as claimed in claim 1, wherein the on-demand anti-virus scan  
14    requests are produced in response to a system administrator requesting a scan of files  
15    within a specified file system.

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17    4.     The method as claimed in claim 1, wherein a pool of threads distribute the on-  
18    demand anti-virus scan requests and the on-access anti-virus scan requests from the virus  
19    scan request queue to the virus checkers, each anti-virus scan request on the virus scan  
20    request queue being serviced by a respective one of the threads in the pool of threads.

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22    5.     The method as claimed in claim 1, wherein the on-access anti-virus scan requests  
23    are given priority over the on-demand anti-virus scan requests by inhibiting the

1 placement of on-demand anti-virus scan requests onto the virus scan request queue when  
2 the number of anti-virus scan requests on the virus scan request queue reaches a  
3 threshold, and not inhibiting the placement of on-access anti-virus scan requests onto the  
4 virus scan request queue when the number of anti-virus scan requests on the virus scan  
5 request queue reaches the threshold.

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7 6. The method as claimed in claim 1, which includes grouping the on-demand anti-  
8 virus scan requests into chunks of multiple ones of the on-demand anti-virus scan  
9 requests, and placing the chunks onto the virus scan request queue.

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11 7. The method as claimed in claim 5, which includes inhibiting the placement of at  
12 least one of the chunks onto the virus scan request queue until completion of anti-virus  
13 scanning for the anti-virus scan requests in a prior one of the chunks.

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15 8. A method of operating a plurality of virus checkers, the method comprising:   
16 distributing on-demand anti-virus scan requests and on-access anti-virus scan  
17 requests to the virus checkers so that the virus checkers perform on-demand anti-virus  
18 scanning concurrent with on-access anti-virus scanning;  
19 which includes grouping the on-demand anti-virus scan requests into chunks of  
20 multiple ones of the on-demand anti-virus scan requests, and for each chunk, distributing  
21 the multiple ones of the on-demand anti-virus scan requests over the virus checkers.

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1       9.     The method as claimed in claim 8, wherein the on-access anti-virus scan requests  
2     are produced in response to user access to files.

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4       10.    The method as claimed in claim 8, wherein the on-demand anti-virus scan  
5     requests are produced in response to a system administrator requesting a scan of files  
6     within a specified file system.

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8       11.    The method as claimed in claim 8, which includes inhibiting the distribution of  
9     the multiple ones of the on-demand anti-virus scan requests from at least one of the  
10    chunks to the virus checkers until completion of anti-virus scanning for the anti-virus  
11    scan requests in a prior one of the chunks.

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13      12.    A method of operating a plurality of virus checkers for on-demand anti-virus  
14     scanning concurrent with on-access anti-virus scanning, the method comprising:

15            combining on-demand anti-virus scan requests and on-access anti-virus scan  
16     requests in a virus scan request queue; and

17            a pool of threads distributing the on-demand anti-virus scan requests and the on-  
18     access anti-virus scan requests from the virus scan request queue to the virus checkers,  
19     each anti-virus scan request on the virus scan request queue being serviced by a  
20     respective one of the threads in the pool of threads,

21            which includes grouping the on-demand anti-virus scan requests into chunks of  
22     multiple ones of the on-demand anti-virus scan requests, and for each chunk, checking  
23     whether the number of anti-virus scan requests on the virus checking queue is less than a

1 threshold, and upon finding that the number of anti-virus scan requests on the virus  
2 checking queue is less than the threshold, placing said each chunk on the virus scan  
3 request queue.

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5 13. The method as claimed in claim 12, wherein the on-access anti-virus scan  
6 requests are produced in response to user access to files.

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8 14. The method as claimed in claim 12, wherein the on-demand anti-virus scan  
9 requests are produced in response to a system administrator requesting a scan of files  
10 within a specified file system.

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12 15. The method as claimed in claim 12, which includes inhibiting the placement of at  
13 least one of the chunks onto the virus scan request queue until completion of anti-virus  
14 scanning for the anti-virus scan requests in a prior one of the chunks.

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16 16. A virus checking system comprising: /  
17 a plurality of virus checkers for on-demand anti-virus scanning concurrent with  
18 on-access anti-virus scanning;  
19 a virus scan request queue; and  
20 at least one processor coupled to the virus checkers and the virus scan request  
21 queue for sending virus scan requests from the virus scan request queue to the virus  
22 checkers, said at least one processor being programmed for placing on-demand anti-virus  
23 scan requests and on-access anti-virus scan requests onto the virus scan request queue,

1 and for distributing the on-demand anti-virus scan requests and the on-access virus scan  
2 requests from the virus scan request queue to the virus checkers.

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4 17. The virus checking system as claimed in claim 16, wherein said at least one  
5 processor and said virus scan request queue are in a file server, and the virus checkers are  
6 separate from the file server.

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8 18. The virus checking system as claimed in claim 16, wherein said at least one  
9 processor is programmed to place each on-access request onto the virus scan request  
10 queue in response to user access of a respective file.

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12 19. The virus checking system as claimed in claim 16, wherein said at least one  
13 processor is programmed to produce the on-demand anti-virus scan requests in response  
14 to a system administrator requesting a scan of files within a specified file system.

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16 20. The virus checking system as claimed in claim 16, wherein said at least one  
17 processor is programmed to execute multiple threads for distributing the on-demand anti-  
18 virus scan requests and the on-access anti-virus scan requests from the virus scan request  
19 queue to the virus checkers, each anti-virus scan request on the virus scan request queue  
20 being serviced by a respective one of the threads in the pool of threads.

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22 21. The virus checking system as claimed in claim 16, wherein said at least one  
23 processor is programmed for giving the on-access anti-virus scan requests priority over

1 the on-demand anti-virus scan requests by inhibiting the placement of on-demand anti-  
2 virus scan requests onto the virus scan request queue when the number of anti-virus scan  
3 requests on the virus scan request queue reaches a threshold, and not inhibiting the  
4 placement of on-access anti-virus scan requests onto the virus scan request queue when  
5 the number of anti-virus scan requests on the virus scan request queue reaches the  
6 threshold.

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8 22. The virus checking system as claimed in claim 16, wherein said at least one of the  
9 processors is programmed for grouping the on-demand anti-virus scan requests onto  
10 chunks of multiple ones of the on-demand anti-virus scan requests, and placing the  
11 chunks onto the virus scan request queue.

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13 23. The virus checking system as claimed in claim 22, which includes inhibiting the  
14 placement of at least one of the chunks onto the virus scan request queue until completion  
15 of anti-virus scanning for the anti-virus scan requests in a prior one of the chunks.

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17 24. A virus checking system comprising: /  
18 a plurality of virus checkers for on-demand anti-virus scanning concurrent with  
19 on-access anti-virus scanning; and  
20 a file server coupled to the virus checkers for sending virus scan requests to the  
21 virus checkers, the file server including a virus scan request queue, and the file server  
22 being programmed for placing on-demand anti-virus scan requests and on-access anti-  
23 virus scan requests onto the virus scan request queue; and for executing multiple threads

1 for distributing the on-demand anti-virus scan requests and the on-access anti-virus scan  
2 requests from the virus scan request queue to the virus checkers, each anti-virus scan  
3 request on the virus scan request queue being serviced by a respective one of the threads  
4 in the pool of threads, the file server further being programmed for grouping the on-  
5 demand anti-virus scan requests into chunks of multiple ones of the on-demand anti-virus  
6 scan requests, and for consecutively placing the chunks onto the virus scan request queue.

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8 25. The virus checking system as claimed in claim 24, wherein the file server is  
9 programmed for producing the on-access anti-virus scan requests in response to user  
10 access to files.

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12 26. The virus checking system as claimed in claim 24, wherein the file server is  
13 programmed to produce the on-demand anti-virus scan requests in response to a system  
14 administrator requesting a scan of files within a specified file system.

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16 27. The virus checking system as claimed in claim 24, wherein the file server is  
17 programmed for checking for each chunk whether the number of anti-virus scan requests  
18 on the virus checking queue is less than a threshold, and upon finding that the number of  
19 anti-virus scan requests on the virus checking queue is less than the threshold, placing  
20 said each chunk on the virus scan request queue.

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22 28. The virus checking system as claimed in claim 24, wherein the file server is  
23 programmed for inhibiting the placement of at least one of the chunks onto the virus scan

1 request queue until completion of anti-virus scanning for the anti-virus scan requests in a  
2 prior one of the chunks.

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